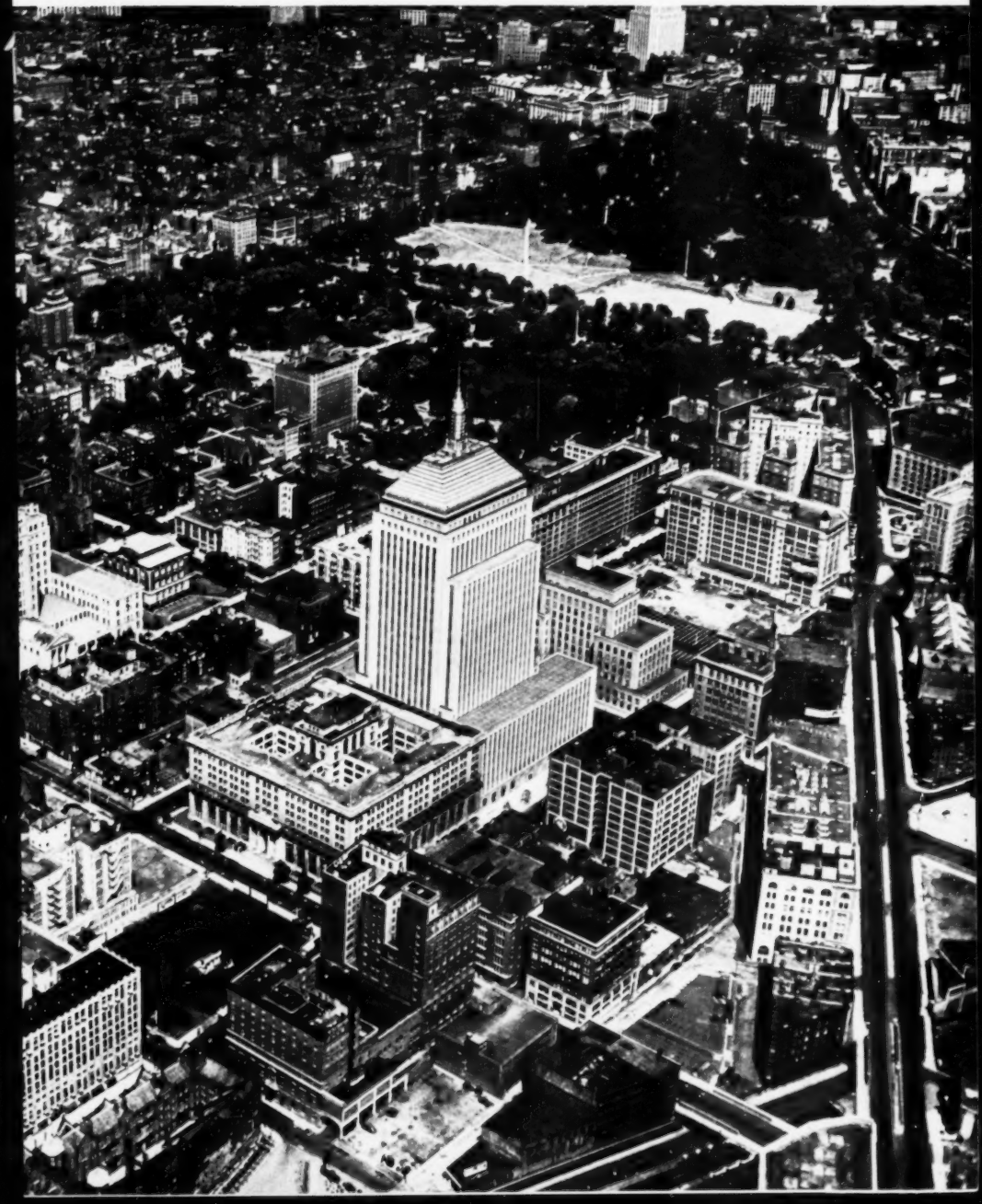
ACI News Letter

Vol. 24, No. 5 JOURNAL of the AMERICAN CONCRETE INSTITUTE January 1953



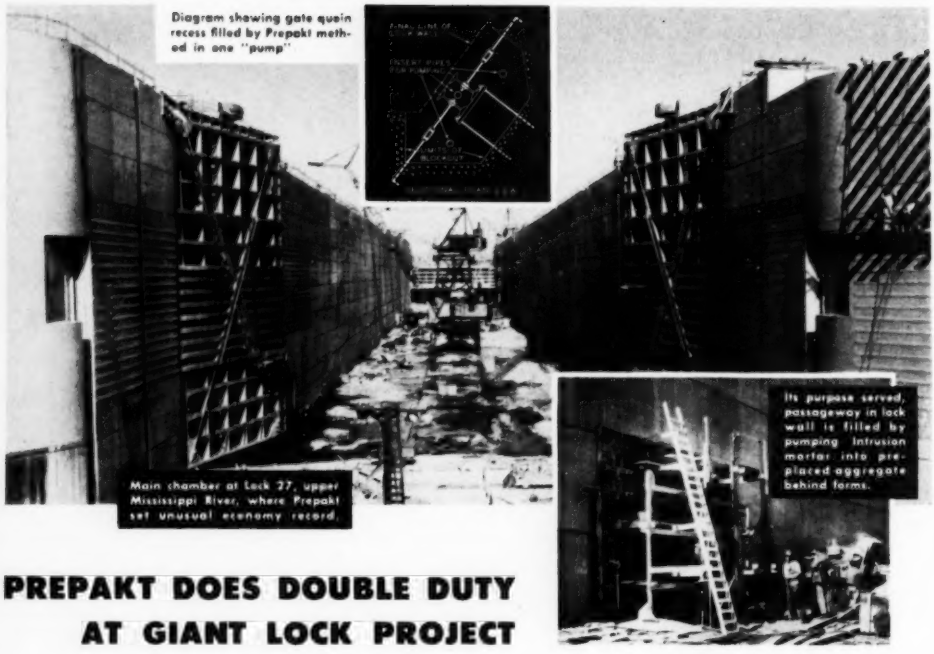


Diagram showing gate quoin recess filled by Prepakt method in one "pump"
Main chamber at Lock 27, upper Mississippi River, where Prepakt set unusual economy record.
Its purpose served, passageway in lock wall is filled by pumping intrusion mortar into preplaced aggregate behind forms.

PREPAKT DOES DOUBLE DUTY AT GIANT LOCK PROJECT

Prepakt methods and materials facilitate the use of the *blockout* technique in the construction of large concrete structures. Subsequent filling of blockouts is easily done with Prepakt concrete, which assures a high strength permanent bond and no setting shrinkage.

An outstanding economy record was produced by this Prepakt technique at Lock 27, upper Mississippi River. In the building of this structure, having a main lock chamber 70 feet deep and an auxiliary one 41 feet deep, Prepakt provided two-way cost savings.

1. A 15′ x 15′ passage was left in the middle lock wall. This permitted thru-handling of materials for pouring the river wall from the mixing and batching plant in the main lock chamber. In this way, an expensive, time-consuming relocation of this plant was avoided.

2. The same technique proved valuable in hanging the lock gates. The diagram above shows how a quoin recess was blocked out for each gate. After the gates were mounted and adjusted, each blockout was filled with coarse aggregate with the open side being formed for its entire height. Intrusion mortar was then pumped into the preplaced aggregate in one continuous operation for each recess. Time saved over conventional methods of placing concrete in limited lifts totalled *five weeks!*

This is typical of the many advantages produced by Prepakt in structural concrete work of all types.

Full information on this or other Prepakt applications may be had by calling or writing the Main Office, Cleveland, Ohio.

THE PREPAKT CONCRETE CO. **INTRUSION-PREPAKT, INC.**
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ACI News Letter Contents

January 1953

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Current Topics Highlight Boston Convention Program

Concrete for jet engine test cells and for radiation shielding, precast concrete, and vibration symposium featured in diversified program

Several articles of extreme current interest will highlight ACI's convention program at the Hotel Statler, Boston, Mass., Feb. 17 to 19, 1953. Among these are discussion of structural refractory concrete for use in jet engine test cells, concrete for radiation shielding, and a number of proposed new Standards and publications of the Institute.

Opening the technical program at 10:00 a.m. in the Statler Ballroom, President A. T. Goldbeck will appoint tellers to count the votes for officers of the Institute and the remainder of this session will be devoted to consideration of Standards and recently developed special publications. E. A. Dockstader, chairman of ACI Committee 505, will introduce "Proposed Standard Specifications for the Design and Construction of Reinforced Concrete Chimneys," and will describe its evolution from the tentative Standard published in 1936 and in use since then. The tentative Standard has been completely modernized and additional design information is given.

Prof. F. N. Menefee, University of Michigan, chairman of ACI Committee 711, will discuss "Minimum Standard Requirements for Precast Concrete Floor Units," which is a revision of the 1946 Standard sponsored by this committee. Principal changes are in the addition of new types of precast units now used in floors.

R. B. Young, member of ACI Committee 611, will discuss the new "Manual of Concrete Inspection," soon to be released by the committee for consideration for publication. Revisions to this popular Institute publication will make it even more useful to the man in the field. This manual has long been recognized as the outstanding publication of its kind.

Raymond C. Reese, chairman of Committee 315, will tell about the "Proposed Manual for Detailing

Continued on p. 4

Reinforced Concrete Highway Structures," which his committee has recently referred to the Standards Committee for consideration for adoption as an Institute Standard. This manual is a companion publication to "Manual for Detailing Reinforced Concrete Structures," which was originally adopted as an Institute Standard in 1948 and in revised form again in 1951. If the highway manual is accepted as an Institute Standard, the eventual aim is to combine the two into one detailing manual.

This session will be closed with the showing of the ACI-PCA film, "Quality Concrete," developed under the technical supervision of a film advisory committee headed by Prof. James A. McCarthy, Notre Dame University, who will introduce the film.

General session

On Tuesday afternoon a general session will be under the leadership of Vice-President Henry L. Kennedy. Leading off this session will be a paper entitled "Building Foundations on Soft Ground," by Dr. Arthur Casagrande, Harvard University, noted authority on soils. This will be followed by a paper by Messrs. Carlson and Pirtz, "Development of a Device for Direct Measurement of Compressive Stress." This paper appeared in the November JOURNAL and will be briefly summarized at the convention to introduce discussion by several individuals who have had experience in use of this stress meter.

Following this, Frank H. Jackson, one of the original members of the Advisory Committee on the Long-Time Study of Cement Performance in Concrete, will give a ten-year report on the results from that research. "Recent Changes in Concrete Construction Specifications for the Corps of Engineers, Department of the Army," will be discussed by George Otterson, Office, Chief of Engineers, with particular emphasis on the reasons for the changes in the specifications. After a brief discussion of the history of jet engine test cells and their requirements, Herman G. Protze, Boston, Mass., will discuss the properties and construction requirements of concrete to meet the extreme conditions existing in such structures.

Films on concrete

An innovation at the Boston convention will be the setting aside of a period on Tuesday evening, February 17, for the showing of a number of films. Those currently listed to be shown are "Operation Concrete," "Prefabrication of Prestressed Concrete Roof Joists," "We Call it Big Creek," "Operation Greenhouse," "Keep Progress Rolling in Texas," and two films showing the use of integral reinforcing and forms in concrete construction.

Vibration symposium

On Wednesday morning concurrent sessions will be devoted to vibration of concrete and design. H. S. Meissner, chairman of the symposium on vibration of concrete, will introduce the subject with a paper entitled "Compacting Concrete by Vibration." The use of vibration in pipe, precast and block manufacture, mass concrete, road construction, and structural work will be

discussed by Messrs. Washa, Tuthill, Timms, and Banker. Other papers in the session will be "Effect of Vibration on Air Content of Mass Concrete," by W. O. Crawley, Waterways Experiment Station, and a paper describing laboratory data on sufficiency and efficiency of vibration by Prof. George Wastlund, Swedish Cement and Concrete Research Institute, Stockholm, Sweden.

Design session

In the design session, presided over by Charles S. Whitney, ACI director, Prof. William Prager will discuss "Limit Analysis and Design," in which problems concerning limit analysis and limit design of reinforced concrete beams and frames will be treated geometrically in terms of the space domain and load space. The procedure will be illustrated by a typical example. Other contributions to the session are "Design Equations for Ultimate Strength," by Prof. Howard Simpson, Massachusetts Institute of Technology; "Stability of Thin-Shell Structures," by Prof. George C. Ernst, University of Nebraska; "Yield-Line Theory for the Ultimate Strength of Reinforced Concrete Slabs," by Prof. Eivind Hognestad, University of Illinois; and "Static and Dynamic Elastic Behavior of Reinforced Concrete Beams," by Joseph Penzien, Consolidated Vultee Aircraft Corp., and Robert J. Hansen, MIT. This latter paper will describe a series of laboratory investigations covering the static and dynamic behavior of reinforced concrete beams. Results indicate that strains of concrete steel may be predicted with reasonable accuracy by both static and dynamic conditions of loading provided that (a) proper allowance is made for the effect of plastic flow and cracking of the concrete and (b) that an exact dynamic theory be used with allowance for the dynamic condition of loading.

ACI awards luncheon

At the Awards luncheon at 12:15 p.m. on Wednesday, Franklin R. McMillan, Charles S. Whitney, Boyd G. Anderson, Mario G. Salvadori, Charles H. Scholer, Gerald M. Smith, and F. Thomas Collins will receive ACI Awards from President Goldbeck.

Mr. McMillan will receive the Alfred E. Lindau Award, founded in 1947 by the Concrete Reinforcing Institute in honor of the late ACI President, Alfred E. Lindau.

Charles S. Whitney, Boyd G. Anderson, and Mario G. Salvadori will receive the Wason Medal for the most meritorious paper of the year, "Comprehensive Numerical Method for the Analysis of Earthquake Resistant Structures," ACI JOURNAL, September, 1951. Charles H. Scholer and Gerald M. Smith will receive the Wason medal for "noteworthy research," reported in "Use of Chicago Fly Ash in Reducing Cement Aggregate Reaction," ACI JOURNAL, February, 1952.

F. Thomas Collins will receive the ACI Construction Practice Award for his paper, "Tilt-Up Construction in Western United States," ACI JOURNAL, October, 1951.

Thin-shell precast concrete

At 2:30 p.m. concurrent technical sessions will resume with that on thin-shell precast concrete being under the chairmanship of A. Amirikian. Papers in this session will include "Thin-Shell Rib Panels Site Fabricated in Plastic Molds," by M. R. Montgomery and Lieut. Comdr. T. G. Atkinson; "Factory Production and Handling Problems of Thin-Shell Rib Panels," by C. D. Wailes, Jr.; "Precast Buildings for Ammunition Storage," by Benton H. Prock; "4,000,000 sq ft of Thin-Shell Rib Panels for Roof Framing," by Charles Zollman; and "Fabrication and Erection of Precast Enclosure Framing for One-Story Barracks," by Ford Twaits and Martin M. Denn.

Concurrently with this a general session headed by Henry L. Kennedy will hear "Concrete for Radiation Shielding," by Edwin J. Callan; "Guniting the Hayden Planetarium Dome," by John H. Hessian; "Accidental Air in Concrete," by Messrs. McNaughton and Herbich; "Correlation Between Laboratory Freezing and Thawing and Weathering at Treat Island, Maine," by Thomas B. Kennedy and Katharine Mather; and "Strength and Durability of Concrete Containing Chicago Fly Ash," by George W. Washa, University of Wisconsin, and Norman H. Withey, consulting engineer.

Research and panel discussion

In the research session at 9:00 a.m., Thursday, February 19, Committee 115, S. J. Chamberlin, chairman, will present reports on about ten projects currently under way in concrete and reinforced concrete research. As usual, these projects are not completed and therefore the information furnished is not for publication.

Subjects tentatively selected for the research session include evaluation of silicones and other waterproofers on concrete, investigation of prestressed concrete for highway bridges, model study of load distribution in short-span highway bridges, effect of polyvinyl acetate additions to portland cement, determination of shrinkage and plastic flow of concrete under constant stress, characteristics of cement grout, post-stressed floor beams using lightweight masonry units and glass cable as the tensioning member, experimental investigation of the hydraulic pressure hypothesis, strength of T-beams under combined shear and torsion loading, and effect of gap grading of aggregates on the various properties of concrete.

The technical sessions will be wound up by a panel discussion on Thursday afternoon headed by Stanton Walker, moderator. The usual lively discussion between a selected group of panel members and the audience is anticipated. It is hoped to emphasize practical problems encountered by the man in the field.

Technical committee meetings

An innovation at the 1953 convention will be the allocation of an entire day, Monday, February 16, to technical committee meetings. The tentative line-up of these meetings is as follows:

Continued on p. 12

Special ladies program scheduled for Boston convention

The following program is being planned for women guests at the ACI Boston convention, February 17-19, with the purpose of making their visit a pleasant one, long to be remembered. Mrs. Howard Simpson, committee chairman for the ladies' program, announced that there will be no charge for any function on the special program, with the exception of the meals. The committee includes Mrs. H. S. Ferguson, Mrs. Emil Gramstorff, and Mrs. H. L. Kennedy.

Each morning

Coffee Hour—Here will be the opportunity to meet your old friends and make new ones. A special lounge room will be reserved for the use of women guests during the convention.

Tuesday, February 17

An informal talk on Boston—This will enable the newcomer and visitor to more fully appreciate the quaintness and uniqueness of Boston. It will also serve as an introduction to the "high spots" which will be seen on the tours.

Luncheon—at an historic Boston eating place.

Guided tour—of Boston, including Beacon Hill, Boston Common and Public Garden, State House, Kings Chapel, site of Boston massacre, Faneuil Hall, Paul Revere House, Old North Church, Boston Navy Yard, U.S.S. Constitution, Bunker Hill Monument.

Wednesday, February 18

Luncheon at Statler Hotel—This is the principal luncheon of the convention, during which the ACI annual awards will be presented and at which time new officers and directors will be introduced. Women guests are invited to attend with their husbands.

Tour—of Christian Science Publishing House and Mother Church. The former houses the famous Mapparium, and the latter is one of the largest and most impressive churches in the world.

Thursday, February 19

Visit—to University Museum, Harvard University, Cambridge, to inspect the famous Ware Collection of glass models of flowers, the only collection of its kind in the world.

Luncheon—at an unusual Cambridge tea room which specializes in Viennese food.

Concert and tour—Isabella Stewart Gardner Museum. This beautiful museum is filled with rare art treasures, and one of its great attractions is the court filled with blossoming plants.

49TH

ANNUAL CONVENTION

February 17-19, 1953

BOSTON

Statler Hotel

DAREX AEA
Used in more concrete construction than any other
AIR ENTRAINING AGENT
On job after job these facts have been proved: air entrained concrete with air content closely controlled through the use of DAREX AEA places easier and faster, finishes quicker, has better surface texture, is more homogeneous and more durable when exposed to freezing and thawing. Readymix concrete plants everywhere can furnish concrete made with DAREX AEA . . . or you can get the same advantages by using DAREX AEA as a gauge water addition. Ask your supplier, or write to us for helpful 20-page illustrated booklet.
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San Leandro, Calif • Montreal 32
DAREX AEA
was used at
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1953 Convention Program

Tuesday, February 17

10:00 a.m.—Georgian Room—Opening remarks by President A. T. Goldbeck and appointment of tellers to canvass annual election ballots.

STANDARDS

Proposed Standard Specifications for the Design and Construction of Reinforced Concrete Chimneys—report of Committee 505, E. A. Dockstader, chairman

See ACI JOURNAL, January, 1953. This Proposed Standard sets forth requirements for the design of reinforced concrete chimneys and outlines construction procedures.

Proposed Revision of Minimum Standard Requirements for Precast Concrete Floor Units (ACI 711-46)—report of Committee 711, F. N. Menefee, chairman

See ACI JOURNAL, November, 1952. Proposes to change existing Standard by adding descriptions of assembled concrete block, precast inverted T-beam joist with precast filler block, and inverted precast slab and T-joist types of floor units.

Proposed Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures—report of Committee 315, Raymond C. Reese, chairman

Brief description of contents of proposed companion manual to present *Detailing Manual*. Now under consideration by Standards Committee.

PUBLICATIONS

Manual of Concrete Inspection—report of Committee 611, J. W. Kelly, chairman

Roderick B. Young, a member of Committee 611, will discuss changes to be incorporated in a proposed new edition of this popular and widely used ACI publication.

MOTION PICTURE

Quality Concrete

This new ACI-PCA film on proper techniques in making good concrete will be introduced by Prof. James A. McCarthy, Notre Dame University, chairman of the ACI Film Advisory Committee which passed on the technical details of the film.

2:00 p.m.—Georgian Room—Vice-President Henry L. Kennedy, chairman

Building Foundations on Soft Ground—Arthur Casagrande, Harvard University, Cambridge, Mass.

Development of a Device for Direct Measurement of Compressive Stress—Roy W. Carlson and David Pirtz, consulting engineer, Berkeley, Calif., and University of California, Berkeley, respectively

Ten-Year Report on Long-Time Study of Cement Performance in Concrete—Frank H. Jackson, Bureau of Public Roads, Washington, D. C.

Recent Changes in Concrete Construction Specifications for the Corps of Engineers, Department of the Army—George Otterson, Office, Chief of Engineers, Washington, D. C.

Structural Refractory Concrete—Herman G. Protze, materials technologist, Boston, Mass.

8:00 p.m.—Georgian Room

MOTION PICTURES

"Operation Concrete"
"Prefabrication of Prestressed Concrete Roof Joists"
"We Call it Big Creek"
"Operation Greenhouse"
"Keep Progress Rolling in Texas"
Other possible added attractions

Wednesday, February 18

Concurrent sessions will be held morning and afternoon in the ***Ballroom*** and ***Ballroom Assembly***

9:00 a.m.—Ballroom—Vice-President C. H. Scholer, chairman

VIBRATION OF CONCRETE

Compacting Concrete by Vibration—H. S. Meissner, Bureau of Reclamation, Denver, Colo., session leader

Vibration Practices in Pipe, Precast and Block Manufacture—G. W. Washa, University of Wisconsin, Madison

Vibration Practice in Mass Concrete Construction—L. H. Tuthill, Bureau of Reclamation, Denver, Colo.

Vibration Practice in Road Construction—A. G. Timms, Bureau of Public Roads, Washington, D. C.

Vibration Practice in Structural Work—John Banker, Portland Cement Assn., Chicago, Ill.

Effect of Vibration on Air Content of Mass Concrete—W. O. Crawley, Concrete Research Division, Waterways Experiment Station, Jackson, Miss.

Vibration Efficiency—Georg Wastlund, Swedish Cement and Concrete Research Institute, Stockholm, Sweden

9:00 a.m.—Ballroom Assembly—Director Charles S. Whitney, chairman

DESIGN

Limit Analysis and Design—William Prager, Brown University, Providence, R. I.

Design Equations for Ultimate Strength—Howard Simpson, Massachusetts Institute of Technology, Cambridge, Mass.

Stability of Thin-Shell Structures—George C. Ernst, University of Nebraska, Lincoln, Neb.

Yield-Line Theory for the Ultimate Strength of Reinforced Concrete Slabs—Eivind Hognestad, University of Illinois, Urbana, Ill.

Static and Dynamic Behavior of Reinforced Concrete Beams—Joseph Penzien and Robert J. Hansen, Consolidated Vultee Aircraft Corp., Fort Worth, Texas, and Massachusetts Institute of Technology, Cambridge, Mass., respectively

AWARDS LUNCHEON

12:15 p.m.—Ballroom—President Goldbeck presents ACI Awards

Report of tellers and introduction of new officers

Recognition of retiring directors and officers

Retiring president's address

2:30 p.m.—Ballroom—A. Amirikian, chairman

THIN-SHELL PRECAST CONCRETE

Thin-Shell Rib Panels Site Fabricated in Plastic Molds—M. R. Montgomery and T. G. Atkinson, Gunther-Shirley-Trepte Contractors, San Diego, Calif., and Civil Engineer Corps, USN, Miramar NAS, Calif., respectively

Factory Production and Handling Problems of Thin-Shell Rib Panels—C. D. Wailes, Jr., C. D. Wailes Corp., Los Angeles, Calif.

Precast Buildings for Ammunition Storage—Benton H. Prock, Prock Construction Co., Camden, Ark.

Four Million Square Feet of Thin-Shell Rib Panels for Roof Framing—Charles Zollman, Vacuum Concrete Corp., Philadelphia, Pa.

Fabrication and Erection of Precast Enclosure Framing for One-Story Barracks—Ford Twaits and Martin M. Denn, Twaits-Morrison-Knudsen-Macco, Los Angeles, Calif.

2:30 p.m.—Ballroom Assembly—Vice-President Henry L. Kennedy, chairman

GENERAL

Concrete for Radiation Shielding—Edwin J. Callan, Waterways Experiment Station, Jackson, Miss.

Accidental Air in Concrete—M. F. MacNaughton and J. B. Herbich, Milton Hersey Co., Ltd., Montreal, Quebec, and Aluminum Co. of Canada, Chute du Diable, Quebec, respectively

Strength and Durability of Concrete Containing Chicago Fly Ash—George W. Washa and Norman H. Withey, University of Wisconsin, Madison, and consulting engineer, Madison, Wis., respectively

Continued on p. 15

Positions and Projects — ACI Members

Bryant succeeds Farmer

Appointment of Earl R. Bryant as technical service director, Universal Atlas Cement Co., New York City, succeeding Homer G. Farmer, who retired after 41 years of service with the company, was announced recently.

Following 11 years as cement inspector and materials engineer with the Missouri State Highway Dept., Mr. Bryant joined the cement company at its Chicago office in 1941 as a technical service engineer. In 1946 he was named technical service manager at Kansas City, Mo., in which capacity he served until his appointment last July as assistant technical service director at the company's headquarters in New York City.

Shortly after graduation from the University of Pittsburgh, Mr. Farmer joined Universal Atlas as a cement sampler at its Universal, Pa., plant, later becoming physical laboratory aide and then mill inspector. In 1914 he was transferred to the technical service bureau at the company's Pittsburgh office. After several years as field engineer in Pennsylvania, Ohio, and West Virginia, he was named eastern manager of the Pittsburgh technical service bureau. In 1928 he was made technical service manager at Chicago, and in 1930 was appointed technical service director. In this same capacity he moved in 1938 with Universal Atlas when it established headquarters in New York City.

Concrete corporation expands

Marietta Concrete Corp., Marietta, Ohio, recently announced the expansion of existing facilities at its Baltimore, Md., plant to provide for the production of precast concrete wall panels. Plans call for completion of the project early this year. When in operation the new plant is expected to have a capacity of 2000 sq ft of finished wall panels a day.

Mavis elected president

Frederic T. Mavis, head, civil engineering department, Carnegie Institute of Technology, Pittsburgh, Pa., has been elected president of the Pittsburgh section of ASCE for 1953.

Steinman elected academy president

D. B. Steinman, internationally known bridge engineer, was elected president of the New York Academy of Sciences at the annual dinner of the Academy on December 4. Dr. Steinman is a Life Fellow of the Academy and was one of the founders of its section on mathematics and engineering.

Hicks promoted

Alvin W. Hicks recently was promoted to assistant director of sales, Marquette Cement Mfg. Co., Chicago, Ill. Prior to this promotion he was sales manager in the company's St. Louis, Mo., office.

A member of ACI and ASCE, Mr. Hicks is a concrete specialist of wide experience. He received engineering training at the University of Texas, subsequently was employed in the engineering divisions of the Missouri Pacific Railroad, Arkansas State Highway Dept., and the U. S. Corps of Engineers before joining the Marquette organization in 1944.

Concrete short course

Georgia Institute of Technology, Atlanta, is sponsoring a short course in quality concrete which will be held Feb. 2-4, 1953, in Atlanta. The course, which includes lectures, demonstrations, films, and actual laboratory participation, is designed to supply up-to-date instruction to the concrete industry on design and control of concrete mixtures, placing, forms, and curing. There will be two sections in the course. One section is planned to appeal to ready-mixed concrete operators, engineers, architects, and contractors; the other section is aimed at the interests of concrete masonry manufacturers.

Cooperating organizations for the short course are AIA, ASCE, AGC, NCMA, PCA, SAME, Georgia Engineering Society, Georgia Society of Professional Engineers, and the Georgia State Highway Department.

All inquiries regarding the course should be addressed to C. H. Taylor, Coordinator, Short Courses and Conferences, Engineering Extension Division, Georgia Institute of Technology, Atlanta, Ga.

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Convention Highlights

Continued from p. 6

Monday, February 16, 9:00 a.m. to noon
Parlor C, Committee 621
Parlor E, Committee 214
Parlor F, Committee 315

2:00 to 5:00 p.m.
Parlor A, Committee 321
Parlor B, Committee 207
Parlor D, Steering Committee, Committee 323
Parlor E, Committee 613
Parlor F, Committee 611

8:00 to 12:00 p.m.
Parlor B, Committee 323
Parlor C, Committee 326
Parlor E, Committee 314
Parlor F, Committee 711

Tuesday, February 17, 9:00 a.m. to noon
Parlor C, Committee 716
Parlor E, Subcommittee 9, Committee 318
Parlor F, Subcommittee 6, Committee 318

8:00 to 12:00 p.m.
Hancock Room, Committee 318
Parlor C, Committee 324

The local committee has made extensive arrangements for entertainment of the wives of members attending the convention (see page 7).

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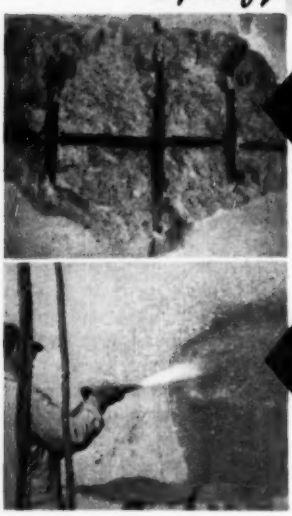

Typical example of spalling. Note corrosion of reinforcing rods exposed by disintegrating concrete.

Reinforced with meshing, the area is restored with gun-applied RESTO-CRETE* by Western Waterproofing Co.

Sound engineering methods, finest materials, trained technicians and over 35 years' experience assure the job will be done *right* when you consult Western. All work done under contract, fully insured, performance guaranteed.

- Protection from Water Damage *®
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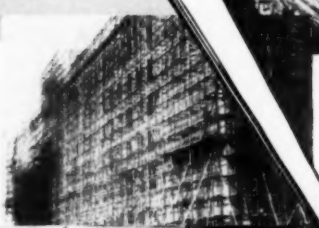
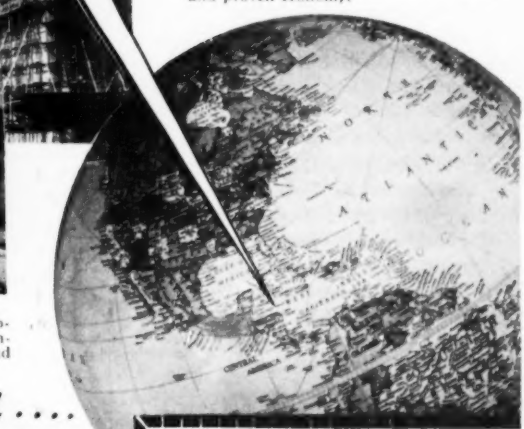
This new housing project, constructed on filled-in-marsh-land, used Protex air entrainment for easier placement and better surface texture.

Hungry Horse Dam, Montana
This one project contains over 3 million cubic yards of Protex concrete. Protex was selected because of its consistent quality and proven economy.

Fuji Bank Bldg., Tokyo, Japan
Economy in this new bank building was realized in initial cost, time and labor, with Protex concrete.



Rio Lempa Dam, El Salvador
This giant state-sponsored project used Protex air entraining agent for high quality concrete under normally unfavorable labor and climatic conditions.



All over the World .... it's Protex

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Please send free booklet, "Facts on Modern Placement of Concrete Through Air Entrainment."

Firm Name_____

Attn. of:_____

Address_____

City_____ State_____

Continued from p. 11

Engineering graduates

The U. S. Office of Education recently reported to the Engineering Manpower Commission new estimates of the numbers of engineers which will be graduated by engineering colleges from 1953 to 1956 as follows: 1953, 23,000; 1954, 19,000; 1955, 22,000; 1956, 29,000.

These revised estimates are based on enrollments reported for the fall term of 1952 and on attrition rates accumulated over a number of years. They do not take into account the effects or probable effects of Selective Service inductions or reserve call-ups by the armed services.

Short course in corrosion

A short course in corrosion, presented by the University of California in cooperation with the National Assn. of Corrosion Engineers, will be held Feb. 2-6, 1953, at the University of California, Berkeley. The short course will consist of a review of the fundamentals of corrosion and corrosion control, covering both the basic science and applied art of corrosion engineering.

1953 Regional Meeting

Plans are already well underway for ACI's sixth regional meeting in Houston, Texas, next fall.

Frank Chappell, structional engineer, Dallas, has been named chairman of the program committee. The committee is building a diversified program and is interested in hearing from those ACI members who would like to present their special project from the rostrum—particularly contributors in the Southwest.

Anyone interested in contributing to the program should send a brief outline of the proposed talk, for consideration by the program committee, to the following address:

FRANK CHAPPELL
ACI Regional Program
Chairman
Burt Building
Dallas, Texas

British Industries Fair

The 1953 British Industries Fair will open April 27 and continue through May 8. Exhibits will be displayed in three halls, Castle Bromwich, Birmingham, and Earl's Court and Olympia, London, England. Earth-moving machinery and other outdoor heavy machinery will be on display alongside the Castle Bromwich exhibit hall.

Exhibits by approximately 2500 British manufacturers are expected for this year's two-week fair, and buyers from a hundred countries are expected to attend. The fair is operated exclusively for buyers except on a few hours each week when workers in factories producing goods for export and other nonbuyer visitors are admitted.

Errata

The following correction should be made in discussion of the paper, "Wave Velocity in Concrete," ACI JOURNAL, December, Part 2, 1952:

p. 636-1—second paragraph, ninth line should read ". . . were 14,700, 14,350, and *14,800* ft per sec. . . ."

Thomson named president

Madison Concrete, Inc., Madison, Ill., recently announced that its ready-mixed concrete operation is under the management of Harry F. Thomson, president.

Mr. Thomson, past-president of ACI, is a recognized specialist in the concrete field. Formerly he was associated with General Material Co., St. Louis, Mo. Recently he had been in charge of the Ready-Mix Concrete Division of Material Service Corp., Chicago, Ill.

Dewey and Almy elect president

Hugh S. Ferguson has been elected president and chief executive officer, Dewey and Almy Chemical Co., Cambridge, Mass. Bradley Dewey, who had been president since the company was founded in 1919, retired January 1.

Road builders to hold meeting

The Hotel Statler, Boston, Mass., will be the scene of the 1953 annual meeting of the American Road Builders Assn., February 9-11. New methods in road building, maintenance, and administration will be discussed.

Convention Program

Continued from p. 10

Correlation Between Laboratory Freezing and Thawing and Weathering at Treat Island, Maine—Thomas B. Kennedy and Katharine Mather, Concrete Research Division, Waterways Experiment Station, Jackson, Miss.

Guniting the Hayden Planetarium Dome—John H. Hessian, National Gunite Co., Boston

Thursday, February 19

9:00 a.m.—Ballroom—Research—Annual open session of ACI Committee 115, Research—S. J. Chamberlin, chairman; G. W. Washa, secretary

This convention feature differs from general sessions in that the information is not released for publication. A group of short papers will be presented on research techniques and preliminary results on fatigue testing of concrete beams, weathering and freezing and thawing tests, impulse loading, stress distribution, volumetric changes, and other subjects. Attendance at the session is the only sure way of being in on these previews of the many future developments in concrete.

2:00 p.m.—Ballroom—Panel discussion—Stanton Walker, moderator

MILES N. CLAIR
Thompson and Lichtner Co., Inc., Brookline, Mass.

M. H. CUTLER
Stone and Webster Engineering Corp., Boston, Mass.

MYLE J. HOLLEY, JR.
Massachusetts Institue of Technology, Cambridge, Mass.

FRANK H. JACKSON
Bureau of Public Roads, Washington, D. C.

FRANK KEREKES
Iowa State College, Ames, Iowa

E. B. OBERLY
Portland Cement Assn., New York, N. Y.

WALTER H. PRICE
U. S. Bureau of Reclamation, Denver, Colo.

CHARLES H. SCHOLER
Kansas State College, Manhattan, Kan.

M. A. SWAYZE
Lone Star Cement Corp., New York, N. Y.

GEORGE W. WASHA
University of Wisconsin, Madison, Wis.

Street and highway conference

The University of California Institute of Transportation and Traffic Engineering and University Extension is planning its fifth California street and highway conference, Feb. 4-6, 1953, at Berkeley, Calif. Of special interest at this meeting will be a summary of California's highway needs. Men prominently identified with the current scrutiny of highway needs in California will summarize and interpret some findings of this extensive investigation.

In addition to many state and local men, a number of men prominent in highway and traffic work throughout the country will participate in the program.

Lightweight aggregates used in school construction

Booming school construction programs in the South may make that area the nation's leader in application of modern design and building methods. Field representatives of the Zonolite Co., Chicago, Ill., producers of vermiculite, reported that Georgia alone has a construction program that will cost about $400,000,000 in the next three to four years.

Typical of some of the new schools are those completed in Cobb county, containing part of Atlanta, Ga. The buildings are long, low, rambling structures in which horizontal lines predominate. The roof deck of each is made with lightweight insulating vermiculite concrete.

It has been estimated that 1,000,000 lb of vermiculite will be used in the South in new schools in the next five years. The material will be used as insulation and as an aggregate in lightweight concrete.

Prestressed concrete lectures

Newark College of Engineering and the Portland Cement Assn. are co-sponsoring a series of eight lectures and discussions on prestressed concrete scheduled for consecutive Monday and Thursday evenings from Apr. 6 to 30, 1953, at the Newark College. This series of lectures is under the guidance of the Department of Civil Engineering and will be open to interested engineers, architects, manufacturers, and contractors.

Those interested in this program should address inquiries to the Special Courses Division, Newark College of Engineering, 367 High St., Newark 2, N. J.

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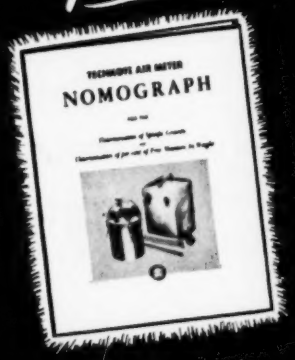

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This new Nomograph when used with the Techkote Air Meter provides a quick and easy means of determining the Specific Gravity and per cent of Free Moisture of Aggregates as used in the testing and designing of concrete mixes.

Every detail for speed and simplicity of computation has been incorporated into its arrangement.

It is scientifically designed and free of error. In addition, it is protected with a water and acid-proof coating for durability in field and laboratory use. The graph (divided into three sections) covers a range of 1.60 to 6.60 which exceeds the Specific Gravity limits of aggregate as used in the construction industry. Also, the graph covers a range of zero per cent to ten per cent for the determination of free moisture by weight and can be projected to thirteen per cent.

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NEW PROCESS—

for Portland Cement Manufacture

U. S. Patent 2,611,714

There are now three processes for cement manufacture —the dry, the wet, and a new non-aqueous liquid process. In the new process a petroleum distillate, not water, is the suspension liquid. This results in the uniformity of the wet process together with the decreased fuel consumption, increased waste-heat power generation and other advantages of the dry process.

For the first time, clinker may be ground in the presence of a liquid, with many features desirable to both the cement manufacturer and the cement user.

Development of the petroleum technology of the new process is a Sinclair Plan project.

For further information apply to the owner of the process.

J. C. WITT, *Consulting Engineer*
5834 Stony Island Avenue
Chicago 37, Illinois

Perlite industry prospects bright for 1953

The phenomenal growth of the perlite industry, which produced more than 33 times as much expanded perlite in 1951 as in 1946, began to show signs of approaching maturity in 1952.

Production of the expanded volcanic rock continued to rise, according to the Perlite Institute, national association of perlite miners and processors, but the annual rate of increase seems to be leveling off. On the basis of preliminary estimates, production of expanded perlite in the United States in 1952 is expected to be in the neighborhood of 150,000 tons, with a total value of about $8,000,000. In 1951, according to a U. S. Bureau of Mines report, sales of expanded perlite amounted to 133,175 tons as compared with 86,962 tons marketed in 1950.

Perlite Institute officials attribute the growing stability of the perlite market to the fact that while mining is confined to seven western states, perlite expanding plants are now established in 32 states. The increase in number and the wide dispersal of these plants made possible short-haul shipment of the expanded product to nearly the entire U. S. market for the first time last year. Future growth of the industry, therefore, is expected to depend less on expansion into new geographical markets, and more on intensive selling in existing markets as well as the development and exploitation of new uses for the lightweight volcanic rock.

To date, the primary use for expanded perlite has been as a lightweight aggregate for plaster and insulating concrete. Perlite-gypsum plaster weighs less than half as much as ordinary plaster in addition to having insulating and fire-retardant properties, while perlite concrete can be designed with only 1/7 the weight of sand-gravel concrete and produces up to 20 times the insulating value.

Three factors point to an even bigger year volume-wise for perlite production in 1953. (1) All indications point to a continued high level of construction activity next year. (2) The Perlite Institute is expected to stimulate the acceptance of perlite by architects and plastering contractors with the announce-

ment early in 1953 of a strictly enforced "product certification program." Under this program, participating producers will be licensed to use an official "certification seal" so long as their product measures up to specifications C 35-52 T of the American Society for Testing Materials, as specified by the Perlite Institute. Periodic inspections by an independent testing laboratory four times a year will insure that all perlite bearing the certification seal complies with specifications. This program has been in the planning stage for nearly a year, and is expected to protect both the building industry and the perlite industry from damage and ill will that could be expected from the production and use of aggregates which fall below minimum quality specifications. (3) At the same time, Perlite Institute members are going ahead with research which is expected to establish new markets for the use of special grades of expanded perlite as a filter powder and as a foundry material.

PCA election

R. A. Hummel, chairman, Lone Star Cement Corp., New York, N. Y., was elected chairman of the board of directors of the Portland Cement Assn., at its annual meeting in Chicago in November.

George E. Warren, president, Southwestern Portland Cement Co., Los Angeles, Calif., was elected director of the association.

Ned H. Dearborn, (right) president of National Safety Council presents the council's top award in the field of industrial safety to John W. Mather, chairman of the Accident Prevention Committee of the Portland Cement Assn.

PCA wins top safety award

A voluntary, humanitarian approach to safety has made the accident prevention work of the Portland Cement Assn. "the nation's number one association safety program," according to Ned H. Dearborn, president of National Safety Council. Mr. Dearborn's remarks were made in presenting an honor award to PCA "for outstanding service to industrial safety" at the association's annual meeting in Chicago in November.

The rate of occupational injuries in the plants of member companies of PCA has been reduced 87 percent in the past 28 years. During this period it was estimated that more than 2000 lives have been saved, 2700 permanently disabling injuries averted, and over 100,000 other lost-time injuries prevented as a result of PCA-sponsored safety programs.

Concrete pipe associations to meet

American Concrete Pressure Pipe Assn. and American Concrete Agricultural Pipe Assn. are planning meetings for February 25 and 26, respectively, at the Baker Hotel, Dallas, Texas.

American Concrete Pipe Assn. will hold its 47th annual convention February 26-28, at the same hotel.

New process developed for portland cement manufacture

By J. C. WITT*

In the manufacture of portland cement, the wet process has the important advantage of uniformity of kiln feed. Advantages of the wet process are due mainly to the presence of a mobile liquid—water. This facilitates grinding, blending, pumping, and storing. Among the disadvantages, the most important is the large quantity of heat required for evaporating the water from the slurry. Also, it is believed that many of the difficulties can be traced to the physical and chemical properties of the liquid.

A recently developed process, U. S. Patent 2,611,714, issued in September, 1952, is said to eliminate some of these disadvantages by using a petroleum distillate instead of water, and is a combination of the wet and dry processes.

Tests have indicated that substitution of a distillate for water may be practicable. In searching for a substitute liquid, it had to meet the following requirements: (1) remain liquid over a large range of temperatures; (2) have no chemical reactions with water or with compounds in cement raw materials, even at high temperature; (3) no deliquescence; (4) boiling point of approximately 300-400 F; (5) low latent heat of vaporization; and (6) reasonable cost and availability.

The distillate can be recovered almost completely by distillation (with or without preliminary treatment of the suspension) and the same supply used repeatedly. Any of the distillate remaining in the raw mix will burn in the kiln, thus contributing to the heat input.

Procedure in processing raw material would be about as follows. The nonaqueous liquid is added to the proportioned raw materials as they enter the compartment or tube mills (as water is in the normal wet process), keeping the distillate at the minimum required for satisfactory slurry. The slurry is pumped to silos, adjusting the composition as desired. Most of the liquid is then decanted, the remainder distilled, and the liquid pumped back to storage tanks. The dry mix is conveyed to the kilns, which are operated as dry process kilns. Collected dust can be added to the slurry, and continuous stirring is not required. The process is also said to be applicable to clinker as well as raw materials. The new process is claimed to have greater flexibility than either the wet or dry process.

The Sinclair laboratories are now investigating the process and results are said to indicate promising possibilities. Pilot plant runs are yet to be accomplished, and the design of any special equipment found necessary. Indications are that a plant layout would consist largely of units now on the market.

*Consulting Engineer, Chicago, Ill.

ACPA short course

The second annual short course school of instruction for members of the concrete pipe industry was held in Chicago, Ill., Nov. 20-22, 1952, under the sponsorship of the American Concrete Pipe Assn. Papers on culverts, sewers, sales, and manufacturing were presented.

Fruchtbaum appointed to N. Y. advisory committee

Jacob Fruchtbaum, consulting engineer, Buffalo, N. Y., has been appointed ACI representative on the New York State Advisory Committee on Fire-Resistive Construction. This committee is undertaking revision of the Industrial Code of New York relating to fire resistant construction.

PCA opens Montana office

The Portland Cement Assn. has opened a new office in Helena, Mont., to carry on its program of educational work, technical service, and promotional activities throughout Montana. The opening of the Helena office will make freely available to cement and concrete users the services of PCA.

Porteus appointed chief engineer

John H. Porteus, until recently assistant chief design engineer in the machinery division, Dravo Corp., Pittsburgh, Pa., has been appointed chief engineer of the Luria Engineering Co. His headquarters will be at the company's steel fabricating plant in Bethlehem, Pa.

Who's Who This Month

Committee 505

"Proposed Standard Specification for the Design and Construction of Reinforced Concrete Chimneys," p. 353, is reported by ACI Committee 505, E. A. Dockstader, chairman. Members of the committee are: Miles N. Clair, H. M. Estes, K. B. Foster, O. G. Julian, E. W. Reeve, and George Shervington.

Myle J. Holley, Jr.

"Progress Report on Prestressed Concrete," p. 401, introduces Myle J. Holley, Jr., associate professor of structural engineering, Massachusetts Institute of Technology, Cambridge.

After receiving BS and MS degrees from Massachusetts Institute of Technology, department of civil and sanitary engineering, he was employed for several years by the S. Morgan Smith Co., York, Pa., as stress analyst and designer.

He returned to MIT in 1946 as an instructor in structural analysis and design and since that time his activity has been divided between teaching and research.

Professor Holley has been an ACI member since 1946 and is a member of the Joint ACI-ASCE Committee 323, Prestressed Reinforced Concrete. He is also a member of ASCE, BSCE, ASEE, SESA, Chi Epsilon, and Sigma Xi.

W. E. Dean

"Prestressed Concrete in Tampa Bay Bridge," p. 409, is described by W. E. Dean, engineer of bridges, State Road Department of Florida, Tallahassee.

Mr. Dean graduated in civil engineering from the University of Florida in 1931. For the past 20 years he has been employed by the Florida State Road Department in positions from construction inspector to engineer of bridges. He has held his present position for the past five years. Mr. Dean is a member of ASCE and NSPE.

Alden M. Klein and J. H. A. Crockett

"Design and Construction of a Fully Vibration-Controlled Forging Hammer Foundation," p. 421, was prepared by Alden M. Klein, assistant manager, New York district, Robert W. Hunt Co., New York City, and J. H. A. Crockett, structural engineer, London, England, for ACI's regional meeting in Chicago, Ill., last September.

Mr. Klein has been associated with inspection, testing, analysis, and research problems in connection with cement, aggregates, concrete, and other construction materials since 1929, serving in the capacity of inspector, laboratory technician and chemist until 1941 when he joined Robert W. Hunt Co. as engineer-of-tests in charge of their New York cement and concrete laboratory.

On leave of absence in 1947 he was engineer-in-charge of a research laboratory established by Pacific Islands Engineers on Guam under a Bureau of Yards and Docks architect-engineer contract for the purpose of investigating and developing concrete aggregate sources, investigating soil problems, and carrying out investigations and tests of other construction problems.

Mr. Klein has been an ACI member since 1949 and is an affiliate member of ASCE.

Mr. Crockett was educated at Oundle School, one of the leading engineering and science public schools in England, and then studied civil engineering at the City and Guilds College, London, for a post-graduate study of building science.

He has worked with a public works contractor as a site engineer and with a firm of consulting reinforced concrete engineers. A particularly interesting job on which he worked early in World War II was the design and construction of radar and anti-aircraft sites on forts 50 miles out from the coast in the North Sea and in Liverpool Bay.

In 1942 Mr. Crockett joined an aircraft firm which carried out especially difficult building and civil engineering works, such as building designs and supervision for the Radar Research Establishment and the

Continued on p. 23

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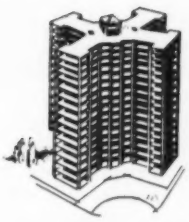

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View of one of three Airslides conveying from three bins to a main cross Airslide.

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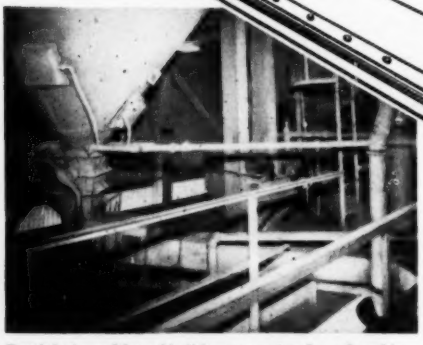

Partial view of four Airslides conveying from four bins; shows F-H Airfeeder and Airslide underneath bin, left. Fuller Aeration Units in cone of bin, for aeration and prevention of arching. Blowers, furnishing air for Airslides and aeration units, in background, center.

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For sheer simplicity, low-maintenance costs and ease of operation, the F-H Airslide Conveyor is just about tops. In this system, dry, fine materials like cement, fly ash, silica, gypsum, are aerated and made to flow like water. Low-pressure air is dispersed through the material from a porous medium so that each particle is enveloped in air, thus reducing the inter-particle friction and the angle of repose. Hence the material flows.

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PNEUMATIC CONVEYING SYSTEMS-COMPRESSORS-FEEDERS AND ASSOCIATED EQUIPMENT

Who's Who

Continued from p. 20

Farnborough R.A.E., where aircraft research is conducted. In 1943 the heaviest forging program of the Ministry of Works was being jeopardized seriously by foundation failures. Mr. Crockett conducted research on how foundations for these machines worked, and he developed a satisfactory design method and practical technique.

Since 1947 he has been working as a consulting engineer and has specialized in foundations for large machinery.

N. M. Newmark

"What Do We Need to Know about Prestressed Concrete?", p. 445, is answered by N. M. Newmark, research professor of structural engineering, University of Illinois, Urbana.

Professor Newmark has been on the University of Illinois engineering staff since 1934 except for a period of war service. He is now in charge of the research program in structural engineering at the University of Illinois Engineering Experiment Station.

During World War II he was engaged in a number of activities here and abroad through the National Defense Research Committee and the Office of Scientific Research and Development, and later was with the Scientific Advisory Group of the U. S. Air Force.

Author of a number of structural papers, Professor Newmark won the ASCE J. James R. Croes Medal in 1944 and ACI's Wason Medal for the most meritorious paper in 1949.

He graduated from Rutgers University, and received MSc and PhD degrees in engineering from the University of Illinois. Professor Newmark has been a member of ACI since 1934 and is a member of ASCE, ASME, ASTM, AREA, Institute of Aeronautical Sciences, International Assn. of Bridge and Structural Engineers, Society of Experimental Stress Analysis, Phi Beta Kappa, Tau Beta Pi, Sigma Xi, and Chi Epsilon.

Curzon Dobell

"Prestressed Concrete Girders Span College Hall," p. 457, is presented by Curzon Dobell, president, The Preload Co., Inc., New York, N. Y.

Since he first joined the company as vice-president in 1942 Mr. Dobell has had responsible charge for the design of 700 large prestressed concrete tanks in North America and many foreign countries; prestressed concrete high-pressure pipelines in the United States, Canada and England; prestressed superstructures for the Walnut Lake Memorial Bridge, Philadelphia, Tampa Bay bridge, Florida, and the Garrison Dam Spillway bridge, North Dakota.

After attending the Royal Military College in Canada, Mr. Dobell studied prestressed concrete design in Europe in 1930. Prior to joining The Preload Co. he introduced the use of prestressed concrete in Canada, first as district manager of Concrete Masonry Restoration Co., Ltd., Montreal, Canada, and later as general manager of The Preload Company of Canada, Ltd.

Mr. Dobell is a member of ACI, ASCE, ISE (London), and the Joint ACI-ASCE Committee 323, Prestressed Reinforced Concrete.

J. C. Rundlett

J. C. Rundlett, author of "Prestressed Concrete Wins Place in Massachusetts Bridge Program," p. 469, is a bridge engineer, Massachusetts Department of Public Works, Boston.

Mr. Rundlett began work with the Massachusetts Department of Public Works in October, 1920, as a cooperative student at Northeastern University, where he graduated in 1924, and has been in continuous service with the department since that time. He entered the bridge department in 1926.

Under his direction the department has pioneered in prestressing. At present a quarter million dollars' worth of prestressed beams for five bridges on the Newburyport Turnpike and on Route 128 are under contract. The design has been completed on three others and preliminary studies are being made for two continuous prestressed structures.

Mr. Rundlett is a member of the Massachusetts State Engineers' Assn. and the Boston Society of Civil Engineers.

Continued on p. 28

Builds factory on sand

The first large plant in the United States to be constructed on sand compacted by "Vibroflotation" will be completed this year at Bonnie, Fla., for International Minerals and Chemical Corp., Chicago, Ill., by Rust Engineering Co., Pittsburgh, Pa., and Birmingham, Ala. The key to the new practice of building on sand is a sand-compaction process called Vibroflotation which Rust Engineering Co. has been franchised to handle by its inventor, Sergey Steuerman, New York City.

The companies concerned believe the success of this new foundation concept may well mark a milestone on the path to greater use of hitherto economically unattractive sand areas such as river basins, shorelines, and deserts for industrial plant building.

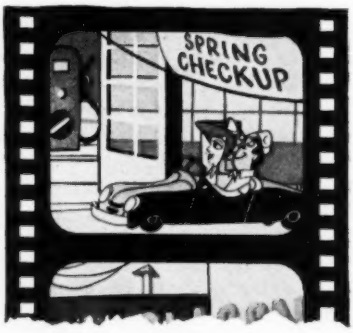
The Vibroflotation process increases the relative density of sandy soil through a shaking and pushing process that packs the sand grains more closely and tightly together and reduces the voids or empty spaces between the particles, resulting in a more solid sand mass.

The device used, called a "Vibroflot," consists of a tube which is vibrated by an electrically driven eccentric inside it, producing a 10-ton centrifugal force. This apparatus is attached to a follow-up pipe which houses required water and electric lines. In operation the Vibroflot is suspended from a crane and guided by vertical wooden leads. Vibrating at full speed it is lowered into the sand while a water jet at its tip forms a saturated sand mass or temporary "quick sand" condition, into which the vibrator rapidly sinks.

Lowered to an average hepth of 13 ft, the device by its vibrating action pounds the sand surrounding it into a tighter mass on all sides. Fresh sand is shoveled in from above to fill the extra space emptied by this compaction. The vibrator is withdrawn in 1-ft stages, being run at each stage until the sand is packed as solidly as practical. An average of 2½ cu yd of fresh additional sand is added by the time it is fully withdrawn. The result is a tightly compacted, sand column about 8 to 10 ft in diameter. The columns are pounded in a predetermined overlapping pattern with about 8 ft between centers. The pattern greatly strengthens the compaction results which give a relative density of 70 to 100 percent.

The complete compaction at the Bonnie plant took two crews 160 days for some 3350 compactions. Results show, after six months, that one of the first structures completed—the phosphate storage building—has experienced no measurable settlement. Advance estimates had allowed for a maximum settlement here of about 1 in.

Rust Engineering Co. sees a future for this technique in construction of earth dams, cofferdams, levees, and airport construction in sandy areas, as well as heavy industrial plants with vibrating equipment. Another special use is in water-retaining dams and underwater structures where Vibroflotation concrete can create unusually tight structures.



At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee (above) and face the life-saving facts about cancer, as presented in our new film "Man Alive!".

You and Ed will learn that cancer, like serious engine trouble, usually gives you a warning and can usually be cured *if treated early.*

For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society

New Members

The Board of Direction approved 48 Individual, 3 Corporation, 11 Junior, and 10 Student Members for December. With adjustments for losses—resignations and non-payment of dues—the total membership was 5942 on December 1.

Individual

BAN, SHIZUO, Kyoto, Japan (Prof., Kyoto University)
BURPEE, L. H., Montreal, Canada (Engr., Dept. of Transport)
CHANLEY, SIMEON, Long Island City, N. Y. (Design)
CHARANPUTH, AMPHON, Dhonburi, Thailand, Siam (Bangkok Municipal Thailand)
CHATE, RAYMOND VICTOR, London, England (Secy., The Reinforced Concrete Assn.)
CHILDERS, JIM B., Corpus Christi, Texas (Chf. Engr., Engineer's Associated)
CURZON, DAVID MACKLEM, Toronto, Canada (Struct. Engr., Margison & Babcock)
CUTTS, CHARLES E., Gainesville, Fla. (Teaching & Research, Univ. of Fla.)
DREHER, ERNESTO J., Rio Grande do Sul, Brazil
DRISKELL, JOHN J., Pasadena, Calif. (Cons. Engr.)
ENNS, THEODORE D., St. Vital, Canada (Design, Estimating, Detailing & Checking, Dominion Bridge Co., Ltd.)
FINK, JOSEPH M., Detroit, Mich. (Chf. of Struct. Engrg. Bureau, Dept. of Bldgs. & Safety Engrg.)
FREEMAN, JOSHUA KENNETH, Chicago, Ill. (Super., Checking, C. M. St. P. &. P. R. R.)
GARCIA, JUAN M., Manila, Philippines (C. E.)
GRAHAM, HERBERT J., Montreal, Canada (Inspector, Charles Warnock & Co., Ltd.)
HALLAND, HENRY N., N. Vancouver, Canada (Coordinating Design & Const., Project Engr.)
HAMS, DON J., Grand Rapids, Mich. (Struct. Design, Supervision, J. & G. Daverman Co.)
HILLEN, WALTER R., JR., Jackson, Miss. (Struct. Engr., Mallett & Assocs.)
HINES, DONALD H., Austin, Texas (Capt., USAF)
HOKANSON, OSCAR M., Pennsauken, N. J. (Struct. Design, The Kuljian Corp.)
JANDT, HOWARD A., S. Pasadena, Calif. (Asst. Chf. Constr. Engr., Southern Calif. Edison Co.)
JEMISON, L. L., Charleston, W. Va. (Bridge Engr., W. Va. State Rd. Comm.)
LAMB, GEORGE W., Topeka, Kans. (Dist. Engr., American Institute of Steel Constr., Inc.)
LINK, ROBERT P., Urbana, Ill. (Teaching, Arch. Struct. Theory & Design, University of Ill.)
LIPKIND, HENRY, Belleville, N. J. (Research Chem., L. Sonneborn Sons, Inc.)
MITCHELL, RICHARD T., Quincy, Ill. (Design, Drafting, Behrensmeyer & Horn)
MONTGOMERY, MAURICE R., La Mesa, Calif. (Operations Manager, Trepte Constr. Co., Inc.)
KOLTSOV-MOSALSKY, ALEXANDER, San Francisco, Calif. (Reinforcing Steel Detailer, Soule Steel Co.)
O'CONNELL, CHARLES T., Chicago, Ill. (Concrete Engr., Material Service Corp.)
OHSAKI, YORIHIKO, Evanston, Ill. (Research Asst., C. E. Dept., Northwestern Univ.)
OSTERHOLM, HARROLD A., Houston, Texas (Struct. Engr., Foster Wheeler Corp.)
OWEN, ROBERT J., Manila, Philippines (Struct. Designing, Atlantic, Gulf & Pacific Co. of Manila)
PAUW, ADRIAN, Houston, Texas (Asst. Prof. of C. E., The Rice Institute)
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REDMAN, RUSSELL P., JR., Jacksonville, Fla. (Mgr., Reinf. Steel Div., Bushnell Steel Co.)
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RYLAND, C. J., Monterey, Calif. (Arch., Engr.)
SEWELL, JAMES A., Newport, Wash. (Cons. Engr.)
SHAH, JAYANTILAL H., Nagpur, India (Managing Partner, Popular Constr. Co.)
SPINEL L., JOAQUIN, Bogota, Colombia (Struct. Engr.)
TAYLOR, ALLAN P., Louisville, Ky. (Vice-Pres., Ky. Light Aggregates, Inc.)
THOMA, EDWARD C., W. Lafayette, Ind. (Teaching, Research, Purdue Univ.)
TSUI, YAT WAH., New York, N. Y. (Struct. Engr., M. W. Kellogg Co.)
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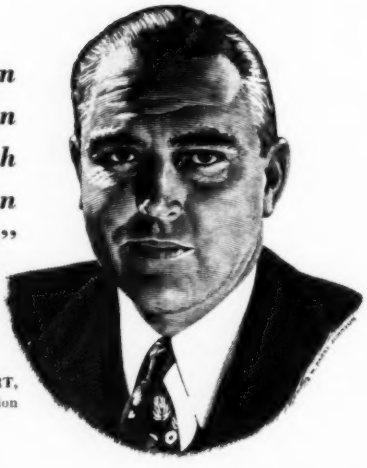

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Income-producing property important but lagging construction market

Importance of new income-producing property as a means of maintaining demand for the services of construction and related industries deserves special emphasis for the years ahead, states a recent issue of *Construction Markets*, publication of the Construction and Civic Development Department, Chamber of Commerce of the United States. As industrial expansion tapers off after its current defense-bred bulge, a shift to office and loft buildings, stores, hotels, and apartments will be required unless private building activity is to undergo a marked decline.

An examination of the figures for past years by the Chamber of Commerce indicates that some obstacles may have to be overcome before income-producing property will prove sufficiently attractive to investors to assure a substantial volume of activity.

Decline of commercial building activity

In proportion to the total amount of private construction, less commercial building (offices and loft buildings, warehouses, stores, restaurants, and garages) is currently being constructed than any time within a record that goes back to 1920, except in the midst of World War II, when there was little private building.

In 1952, commercial building will account for only 4.4 percent of all private construction, in comparison with an average of 10.2 percent for the years 1920 through 1924 and 11.8 percent for the years 1925 through 1929. The low figure for 1952 is partly caused by the severe limitations on credit and materials imposed by the government. But the average of all the years after 1945 to the present shows commercial building representing only 7 percent of total private building. Only one of these years, 1946, resulted in a ratio of 11.7 which is in line with the average ratios for the predepression years.

Even during the depression, the proportionate volume of commercial building held up well, with ratios of 13.3 percent for the years 1930 through 1934 and 8.7 percent for the years 1935 through 1939. On the basis of all of these figures it is apparent that commercial building has not kept pace with the expansion of private construction generally.

If the physical volume of private building is examined, the same conclusion is reached. The average total physical volume of private building for the years 1946 through 1951 (as measured in terms of the constant price estimates of the Department of Commerce) has surpassed that of the average of the boom decade of the 1920's by 3 percent and has exceeded that of the average of the depression years, 1930 through 1939, by 139 percent. In contrast, the average annual physical volume of commercial building from 1946 on is 33 percent below the average of the boom decade and only 54 percent above the average of the depression decade.

Lag in apartment and hotel building

Even more serious evidence of lag is shown in another important type of income-producing property—multifamily apartment buildings (buildings containing more than two family dwelling units). During the 1920's, privately financed multifamily buildings on the average accounted for 23 percent of the annual total number of dwelling units started. During the postwar years, 1946 through 1952, privately built multifamily buildings will have provided only about 10 percent of all private dwelling units started in that period.

The average annual number of units in multifamily buildings started during the 1920's was 167,000; and during the boom period in the second half of the decade, a peak annual production of 257,000 privately owned units was reached. The average annual production of private multifamily units in the years 1946 through 1952 will not exceed 105,000 to 110,000. Recent multifamily building is thus about 35 to 40 percent less than it was 25 to 30 years ago despite an increase of over 50 percent in the number of nonfarm households between 1930 and 1950, and despite availability, during a large part of the recent period, of a form of government-insured financing that provided for long-term, low interest bearing mortgage loans requiring practically no equity investment.

If comparable statistics were available, hotel building would undoubtedly show an even greater lag. Outside of probably Florida, Texas and California, there has been little hotel building since the end of the war,

and almost none of any importance during the 1930's.

What does the lag mean?

Income-producing property has lost much of its former favor with investors due to a number of possible causes, states *Construction Markets*, although the impacts of taxation seem to be the major cause for lagging construction.

During the booming 1920's there was undoubtedly overproduction of all the building types referred to. In terms of the level to which general economic activity was reduced by the depression, the overbuilding was severe; the losses were serious and the memory of the disaster has been a long one and no doubt still has an influence in determining investors' decisions. Nevertheless, at present the losses have been absorbed, the structures themselves are now almost universally on a profitable basis, commercial building and apartment vacancies are at a minimum, numerous technological advances have been made in the science of construction, and the level of business activity has far exceeded that of the 1920's. In other words, there is evidence of undersupply of buildings; the buildings themselves are obsolete in terms of what is now possible; and the economy is expanding.

Nor can it be claimed, says the Chamber of Commerce report, that any general scarcity of investment funds is at the root of the lag. Savings have been at record highs during the postwar period. The easy money policy permitted by the Federal Reserve Board until March, 1951, added large amounts of bank credit to savings as a basis for capital expansion, which has surpassed all previous levels.

Special inducement has been provided to guide capital in directions considered necessary for defense by the government. Thus industrial building for defense and defense related needs has been greatly helped by the special tax depreciation allowances, while income-producing property received no assistance. Also, during the two years 1947 and 1952, commercial building activity declined as a result of restrictions that had been imposed in the years immediately preceding. Nevertheless, the artificial diversion of capital to industrial building and the temporary restrictions on commercial building can hardly account for all of the observable lag, states the report.

Multifamily housing, moreover, was especially favored from 1946 through 1949 by the government-insured loan program and yet has not achieved anything to compare with its earlier position. The persistence and rejuvenation of rent control, although not applying to new building until the 1951 act, undoubtedly has added to the skepticism of investors, reports the Chamber of Commerce, but cannot wholly explain the situation.

Tax impediment

If one type of investment lacks favor in comparison with other types, states the report, the reason usually is the simple one that its earnings prospects don't stack up well in the comparison. This seems now to be the case with investment in income-producing real estate. On the one hand, it must cope with high construction cost and with constantly mounting maintenance cost. On the other hand, it has to face a combination of local and federal taxes which seem peculiarly designed to prevent it from profitably realizing on its initial costs or of keeping ahead of its maintenance and modernization costs. The resulting squeeze is at the root of the investment problem and the lag in this potentially important construction market.

Who's Who

Continued from p. 23

J. F. Jelley

"Looking to the Future in Prestressed Concrete Construction," p. 485, is related by Rear Admiral J. F. Jelley, CEC, USN, chief, Bureau of Yards and Docks, Department of the Navy, Washington, D. C.

Following engineering duties at various naval stations, Admiral Jelley was in charge of construction of the Naval Air Station, Alameda, Calif., in 1941, and the Naval Base at Terminal Island, Long Beach, Calif., in 1942. This work involved many types of concrete structures such as hospitals, barracks, large prestressed oil tanks, and large concrete graving docks. In 1946 Admiral Jelley was named deputy chief of the Bureau of Yards and Docks and in 1949 was named chief.

He has been particularly interested in the use of thin shell precast concrete and pre-

stressed concrete in the construction of naval shore facilities.

Admiral Jelley received a BS degree from the U. S. Naval Academy in 1927 and CE and MCE degrees from Rensselaer Polytechnic Institute in 1931 and 1932. He is a registered professional engineer in the District of Columbia, a member of ACI and of its Board of Direction, a member of ASCE, Sigma Xi, and of the International Assn. of Navigation Congresses.

Maxwell M. Upson

"Construction Problems of Prestressing," p. 489, is discussed by Maxwell M. Upson, president, Raymond Concrete Pile Co., New York, N. Y.

During the first eight years of Dr. Upson's career he was associated with Westinghouse, Church and Kerr, Pittsburgh, Pa., and New York City, advancing to the rank of managing engineer, and with the Hockanum Mills, Rockville, Conn., where he was assistant to the president and chief engineer. In 1907 he joined the staff of Raymond Concrete Pile Co., New York City, serving successively as general manager, chief engineer, and vice-president, and since 1931 as president.

His patents, of which he holds more than 40, control many of the well-recognized methods used in the placing of concrete piling and caisson foundations.

He received a BA degree from the University of North Dakota in 1896, ME degree from Cornell University in 1899, and the degree of doctor of engineering from the University of North Dakota in 1941.

An ACI member since 1912, Dr. Upson was a member of the Board of Direction and is an Institute past-president. He is a member of ASCE, ASME, ASTM, and in 1940 was awarded the Edward Longstreth Medal by the Franklin Institute.

Honor Roll

February 1—November 30, 1952

Newlin D. Morgan is still leading the Honor Roll with 38 credits and F. Thomas Collins is second with 13. Ricardo Acosta and Howard Simpson are tied for third place with 12 credits each.

A little more than 1 percent of the total membership has added 330 new members this year. If each member would introduce one new applicant the benefits both to them and to ACI would be doubled.

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Howard Simpson	12
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C. H. Scholer	9
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Theodore O. Reyhner	7
Lawrence L. Schwinn	7
Walter H. Price	6
Chester P. Siess	6
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K. E. Whitman	3
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Sterling L. Bugg	2½
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Field Practice in Lightweight Concrete—John A. Murlin and Cedric Willson

Use of Concrete in Residential Construction—C. O. Christenson

Practical Design of Thin Retaining-Wall Footings—R. P. V. Marquardsen